



A Kaleidoscopic Look at Danish Competitiveness and Productivity

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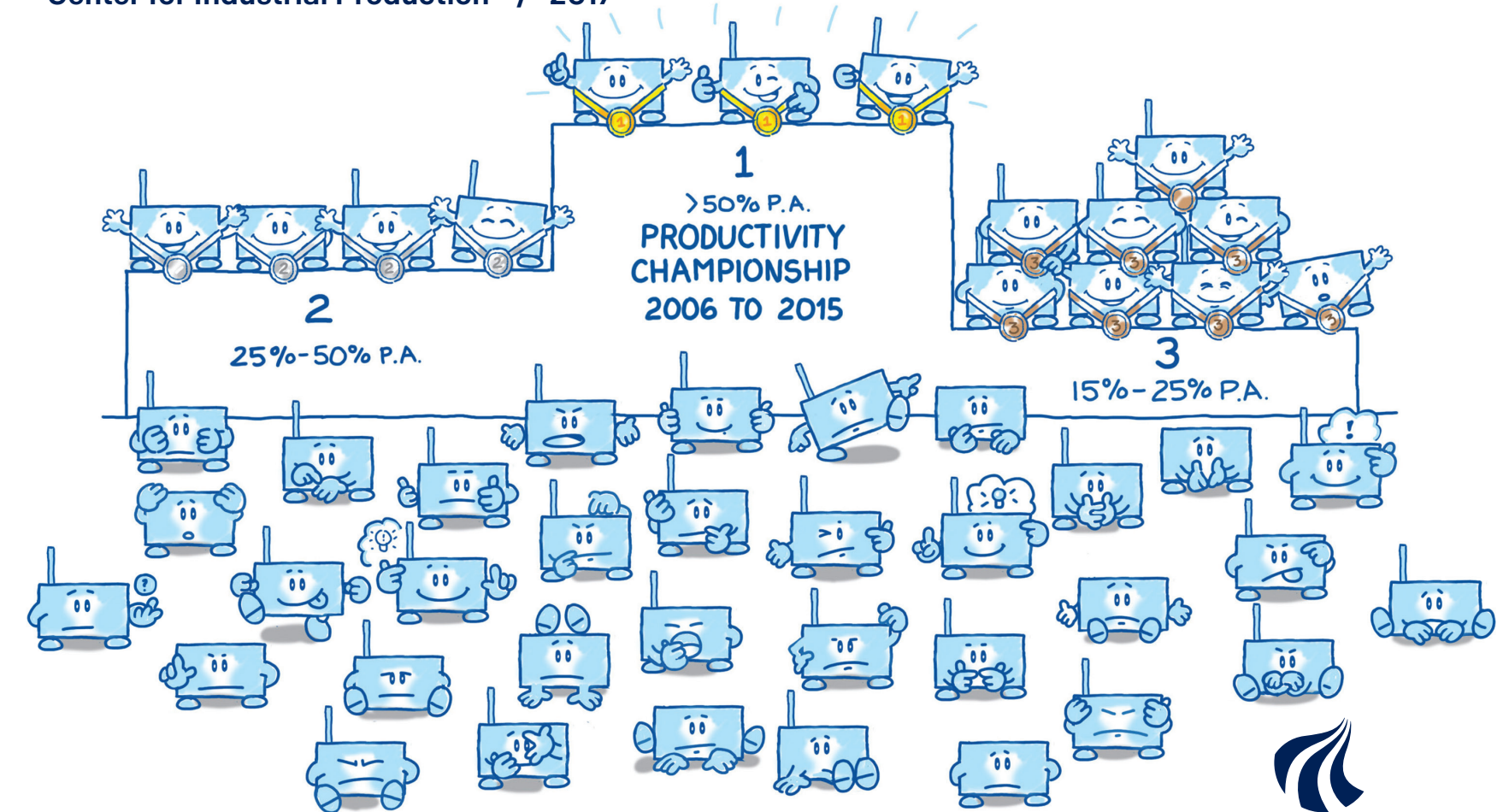
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A KALEIDOSCOPIC LOOK AT DANISH COMPETITIVENESS AND PRODUCTIVITY

Center for Industrial Production / 2017



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A kaleidoscopic look at Danish competitiveness and productivity

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FOREWORD

The starting point for this work is, on the one hand, that Denmark has a productivity problem. On the other, we have also seen examples of Danish enterprises that have achieved remarkable and sustainable productivity results. Some enterprises are able – in the short term – to achieve increases in productivity of >30% and subsequent productivity increases of >12% per annum.

These enterprises provide a possible source of inspiration. Perhaps they hold the key to Denmark's productivity problem. How do these enterprises achieve their results? Do they employ special methods or do they organise projects in certain ways? Are these enterprises more dedicated in their 'hunt' for high productivity than the average business? The questions are many.

It is to some of these questions that this report will attempt to find answers. The report focuses exclusively on the private sector and mainly on the manufacturing sector although this sector is currently in decline.

The Danish Productivity Award

For several decades, the Confederation of Danish Industry has been an exponent of increasing productivity and developing the productivity concept in Danish industry. Since 2006 (and until 2015) the Confederation of Danish Industry has annually rewarded Danish enterprises that have achieved outstanding and sustainable productivity results in order to hold up these enterprises as sources of inspiration or models for the rest of industry.

We presume that enterprises applying for the Danish Productivity Award represent the 'pinnacle' of Danish industry.

A total of 66 enterprises have applied for the Danish Productivity Award. We have had access to 54 applications which form the basis of the analyses and reflections presented below.

We are indebted to the Confederation of Danish Industry who have been helpful in obtaining these enterprises' application material for the Danish Productivity Award as well as permission to use the material for this project.

All companies participating in this study appear anonymously. The project group has detailed knowledge of all applications and is also in possession of the names of the companies included in this study.

The authors are aware that this report does not represent a conclusive and comprehensive picture of the development of productivity in Danish industry. The available data are too sporadic for that and the number of companies does not cover the breadth of Danish industry. That is why we have used the title of 'A kaleidoscopic look at Danish competitiveness and productivity'.

We hope that, despite the obvious limitations to the data used, the material may inspire company executives and other decision-makers who have direct or indirect influence on the development of productivity in Danish industry. Whether we have succeeded is for the reader to judge.

Enjoy the book – The Authors, June 2017

THE BASIS OF THE STUDY

We do not aim or intend to discuss or map the overall picture of the Danish productivity issue or the comprehensive analyses and research that has been carried out in this field. We have limited ourselves to taking as our starting point a few selected papers from the wealth of material that has been produced in recent years as part of the on-going debate about the development of productivity in Denmark.

It should be noted that this debate is not only a Danish phenomenon, but a global one.

The productivity debate is more nuanced and has more dimensions to it than the ones we are able to include here. We are well aware of these limitations and believe that 'our' available data have a number of shortcomings and do not entitle us to attempt a more comprehensive approach.

The Danish Productivity Award

Our report is based on the Danish Productivity Award. Applications for the Danish Productivity Award submitted by 54 enterprises have been used in this report.

The Danish Productivity Award was set up by the Confederation of Danish Industry in 2006. In the period 2006-2015, a total of 66 Danish enterprises applied for the Productivity Award. The award is presented once a year at the Confederation of Danish Industry's annual conference at Hotel Munkebjerg. All applicants are members of the Confederation of Danish Industry, an employer association.

12 applicants for the Danish Productivity Award have not wished to participate in this study, including two winners of the award.

A total of eight winners have won the award as the award was not presented in 2009 and 2011 for reasons that are not discussed here. Application material from six of these winners forms part of this study as two winners, as stated above, did not wish to participate. No immediate reason was given for the refusal of these enterprises to participate in the study.

Participating companies represent different industries, enterprise sizes and ways of working with productivity. The enterprises have applied for the award on their own initiative, encouraged by the Confederation of Danish Industry or other organisations.

As stated above, a total of 66 written applications for the Danish Productivity Award that document and describe the results achieved by the enterprises as well as the approaches and methods used to achieve these results are available. Applications vary a great deal in scope – between 8 and 20 pages – as well as quality.

The applications were completed by the applicants themselves. The applications are therefore based on the enterprises' own descriptions, assessments and documentation. This study takes the descriptions and documentation provided by the enterprises at face value.

However, a few applications and sections of other applications have been omitted where these have been inadequate or even misleading.

Award assessment procedure

All applications submitted for the Danish Productivity Award were assessed by an appointed panel of experts on which both representatives from industry and academic institutions served over the years.

The panel is put together by the Confederation of Danish Industry. Some of the applications, and indeed all winning candidates, were verified by consultants from the Confederation of Danish Industry. This involved approx. 20-30% of the population as a whole.

The project group has not had access to the assessment material developed by this panel of experts or data related to the verification.

The weighting and merit of the applications

All applications carry equal weight in this study. Applications that have won or been nominated to win the Productivity Award are therefore not attributed a higher validity or reliability value than other applications. It is important to point out that the applications vary in scope (depth) and quality (descriptions, documentation etc.).

The authors believe that the 'merit' of the applications included in the study is acceptable and useable as a basis for this report. As stated above, the project group has had access to 54 applications where five enterprises have used the same productivity initiative as the basis for their application for the award twice. These applications have been consolidated so that the overall gross data comprise 49 different productivity initiatives.

One application was deemed to contain insufficient information for an analysis of the content and performance outcomes.

A further five applications were found to contain insufficient information for an analysis of 'change leadership' and were therefore omitted from the section entitled 'CHANGE LEADERSHIP IN PRODUCTIVITY INITIATIVES' on page 23. The descriptions of results

contained in a further 11 applications were not found to be comparable to the data in other applications. These applications were therefore excluded from the analysis of results achieved which means that only 38 applications form the basis for the analysis of productivity results. A further three applications were omitted from the analysis of time-horizon v. results achieved. An overview of the above can be found in Figure 1.

Sources of error

The data have many sources of error and uncertainty. In 2010, the application format changed from the format used at the beginning in 2006. The new format emphasised companies' change management more than was the case in previous application formats.

The companies also had a free hand in the definition and choice of their productivity parameters. This results in an imprecise and diverse definition of the concept of productivity which, naturally, affects the validity of the analyses.

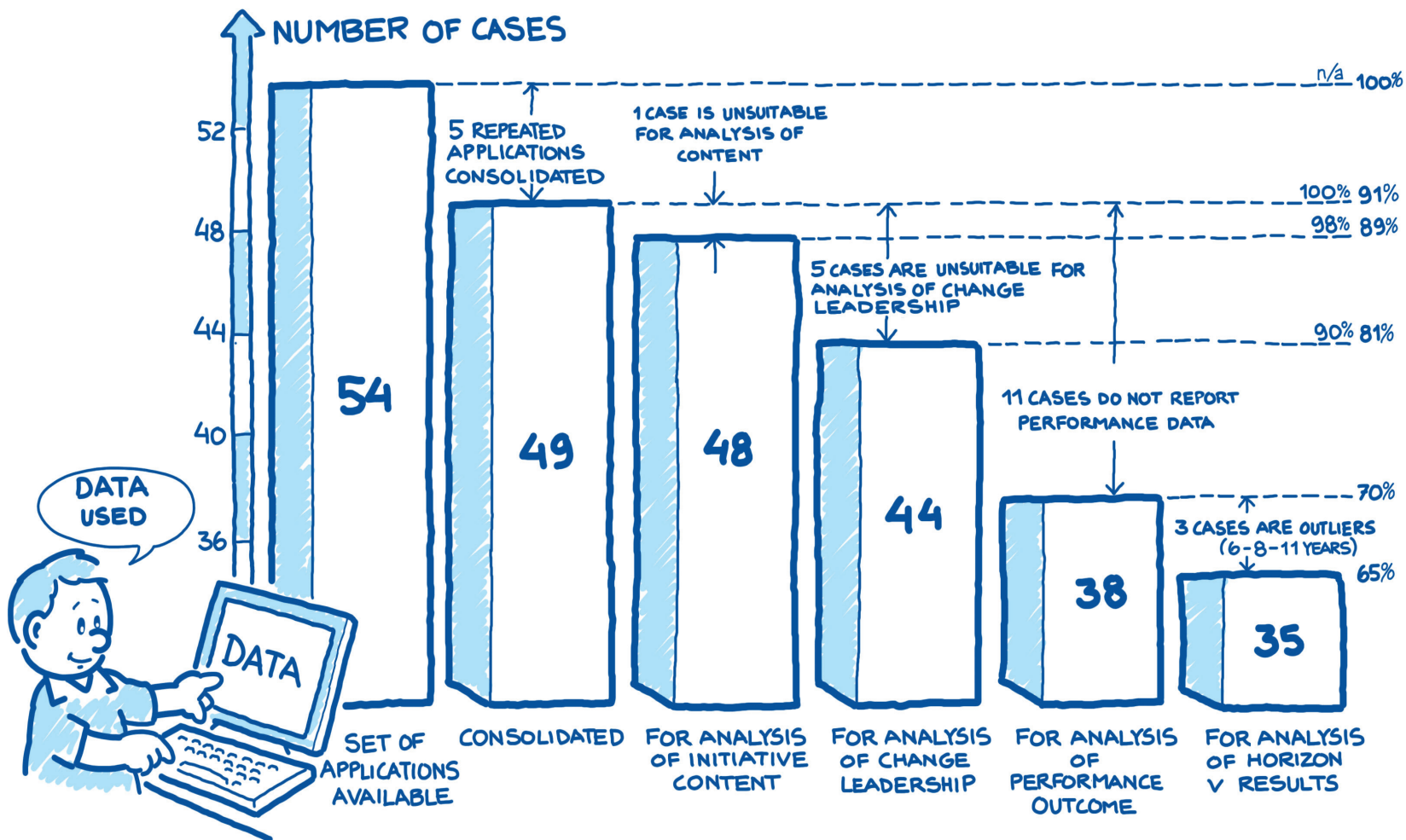
Organisation and timetable

The project was performed by Professor John Johansen, Executive MBA Claus Rothmann, PhD Associate Professor Rikke Vestergaard Matthiesen and PhD student Henrike Boer, Center for Industrial Production, AAU. A steering group has been set up with the participation of the Confederation of Danish Industry. The steering group has met a few times and the project has been presented to selected representatives of the Confederation of Danish Industry.

Future perspectives

This project is regarded as a preliminary study and as input in the formulation of a bigger and more comprehensive project. The in-

FIGURE 1



tention is therefore to replicate the project on a larger scale. Partly by expanding the population of enterprises to ensure that the population represents the composition of Danish manufacturing industry more accurately and partly by designing the data collection to accommodate statistical analyses that will provide greater normative insight.

Lack of increase in productivity

It is generally accepted that Denmark has a productivity problem. The scope of the problem varies depending on industry, private sector, public sector etc. It is also a fact that examples of Danish companies that have achieved remarkable and sustainable productivity results are available. Perhaps these enterprises hold the key to Denmark's productivity problem?

Why are some enterprises able to achieve one-off productivity increases of >30% and >10% per annum? How do these companies accomplish this? Do they employ special methods? Do they organise their projects in a certain way? Are these successful enterprises more dedicated in their 'hunt' for productivity than the average business? The questions are many and varied.

Productivity does not just affect a company's ability to survive and compete. Satisfactory increases in productivity in the private and public sectors affects the development of and opportunities in the whole of the wider society. The productivity debate is therefore a question that affects us all.

Many productivity initiatives

Different fora – governments, trade organisations, professional organisations etc. – have appointed various commissions, think-

tanks and groups of experts who have all been tasked with identifying the possible causes of the lack of increase in productivity in Denmark and developing solution strategies.

The many initiatives have generated a range of plausible explanations for the lack of increase in Danish productivity – but also a corresponding number of often diverging strategy proposals to address the problem.

They all have one thing in common, however: the belief that satisfactory growth in productivity is essential to employment and the development of the Danish welfare state.

"Growth in productivity and value creation are the primary drivers for increasing prosperity and enhancing living conditions over time.

Increased productivity in the private sector will not only lead to higher real wages for employees in the private sector, but will also affect real wages for employees in the public sector. Recipients of public benefits will also experience increased purchasing power through the adjustment of rates."

/ Ministry of Finance, 2014 /¹

Satisfactory growth in levels of productivity forms the basis for the development of Danish competitiveness and thereby Danish living standards, Denmark's education and health care sectors etc. Even a modest difference (positive or negative) in productivity development over a number of years will change Denmark's basic conditions significantly.

Denmark's lagging productivity growth

Figure 2 shows the growth in hourly productivity in a range of countries in the period 1995 to 2012. The Danish ranking is based on numbers provided by the Danish Ministry of Finance in 2012. This data ranked Denmark no. 31 on the list – surpassed by countries such as Poland, Hungary, the United States, Sweden, the United Kingdom, Germany and Norway which are some of our most important export markets.

“In recent years, production per working hour has risen much slower than we were previously used to. It has also risen more slowly than in those countries with which we like to compare ourselves.” / the Danish Productivity Commission, 2012/².

Although subsequent adjustments published in 2016 have revealed a somewhat higher rate of productivity increase in Denmark from 2000 to 2015, annual productivity increases in the United States and Sweden still exceed the Danish rates by more than 20% in this period. Over a number of years, this difference becomes a significant shortfall both in terms of competitiveness and welfare.

“Growth in hourly productivity in Denmark has been weak over the past 20 years compared to other OECD countries. As has been mentioned, this is problematic because productivity in the long term is the main growth driver in the economy. ”
/ Ministry of Finance, 2014 /³

Sources of productivity

All sources of prosperity are, of course, important. But to quote the Productivity Commission, 2013, productivity is typically the single factor that contributes the most:

“Increased productivity has contributed to half of the total increase in prosperity in Denmark despite the fact that we have seen weak growth in productivity.”

/Productivity Commission, 2013/⁴

Productivity growth is driven by new technological opportunities, new forms of management, systems, education and research etc.

“Growth in productivity is about how we can do things in a smarter way in order to create greater value with a smaller amount of resources.”

/Productivity Commission, 2012/⁵

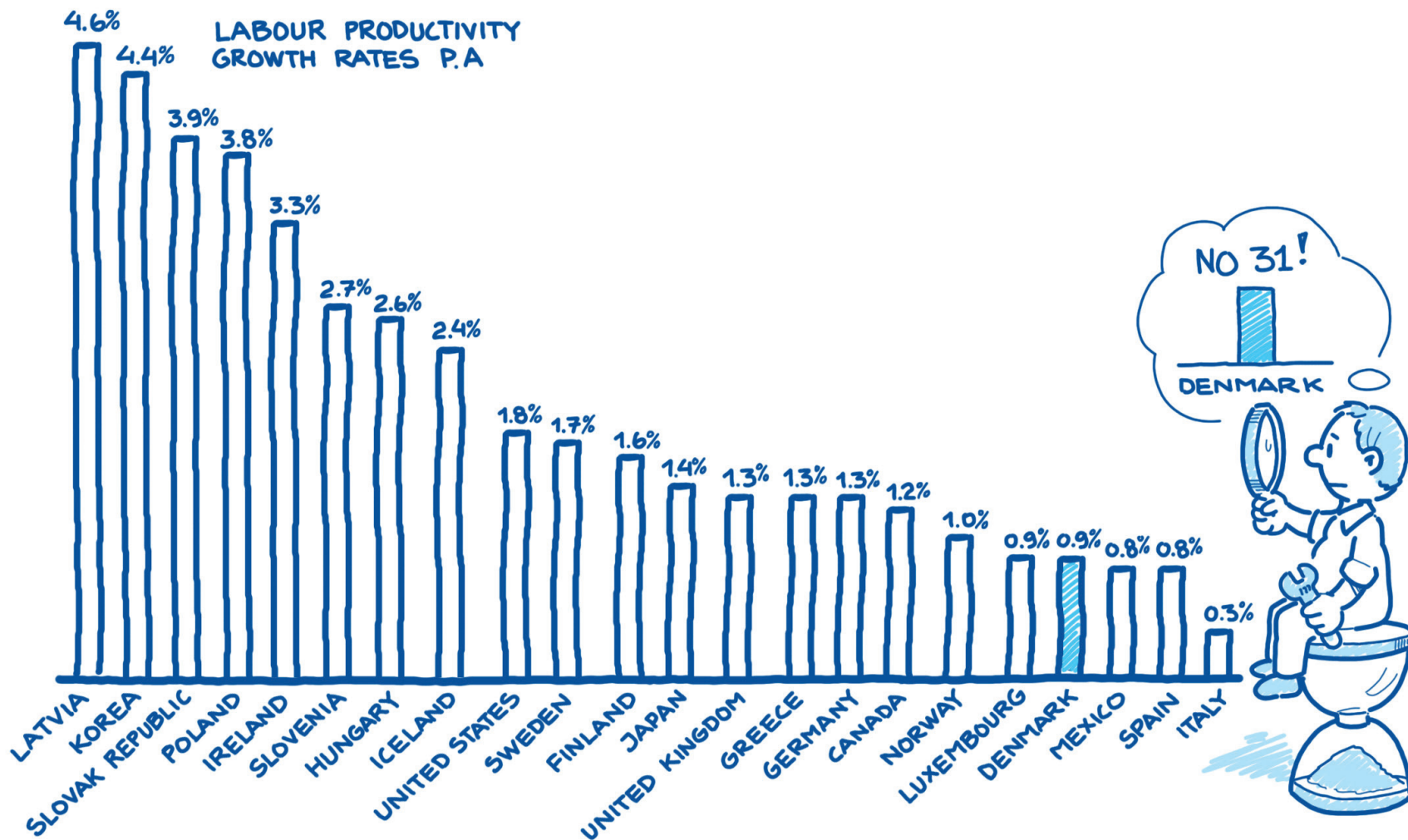
Productivity development is also driven by visionary management, employee commitment and will – just as productivity and the impulse to work with productivity correlate with a company's competitive, cultural and market situation.

Definition of productivity – cf. Gyldendal – Den Store Danske Encyklopædi defines productivity as:

“a measure for the exploitation of effort, e.g. labour, in a production process. In the production of a single product with a single input, productivity can be expressed by the average product, i.e. output per unit input. If production is more complex, general measures for input and output must be used. This will most often be the value of input or output calculated at the prices at which each product is traded.”

/Gyldendal, 2014/⁶

FIGURE 2



In this study, the availability of data has been limited to the numbers stated in the applications; these numbers have been established in different ways and are subject to uncertainty etc. This has presented the project group with a challenge. In this project, we have as far as possible 'calculated/assessed' the achieved gains in labour productivity (the prevailing form of productivity results reported in the applications), capital productivity and resource productivity.

The three areas of productivity have been weighted collectively – using our best estimate – to allow us to work with an overall productivity result per application. To compensate for the uncertainty involved in this calculation, we have chosen to work with productivity intervals of 5%.

Our considerations do not take into account the impact that each productivity initiative has had. The fact that the initiatives vary in scope (from 50 to >1000 employees) does, of course, carry an enormous significance. As mentioned above, this has not been included in our further considerations.

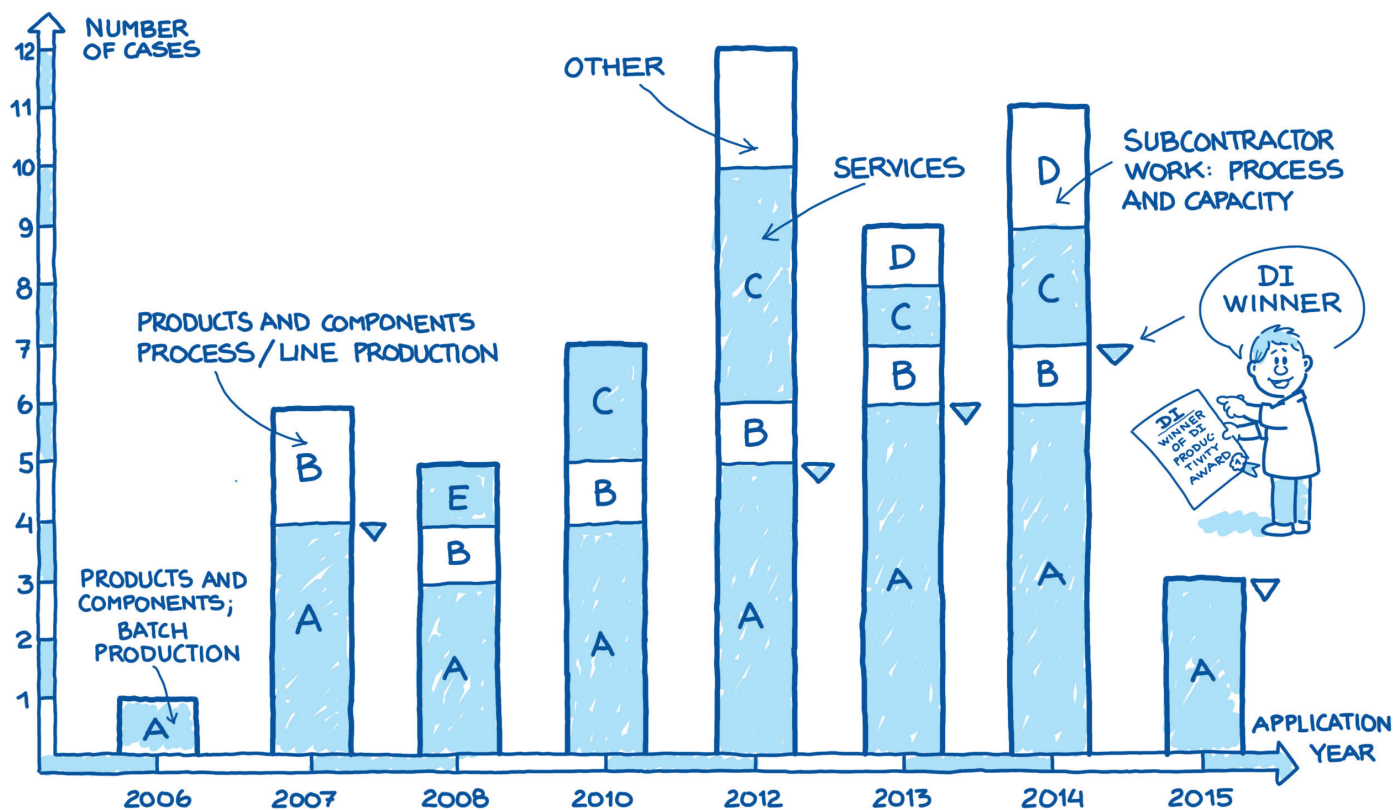
DATA OVERVIEW – APPLICATION YEAR AND TYPE OF INDUSTRY

Figure 3 shows the population of applications (54) on the basis of year of application and type of industry. The winning companies are indicated by a triangle.

In terms of periods, the data are asymmetric as the number of candidates for the Productivity Award and the number of appli-

cations available to the project have varied somewhat from year to year – from one application in 2006 to 12 applications in 2012. The documentation format has also changed over the years. As mentioned above, five companies have applied for the Productivity Award several times. Some companies applied at intervals of a few years; other applied two years in a row.

FIGURE 3

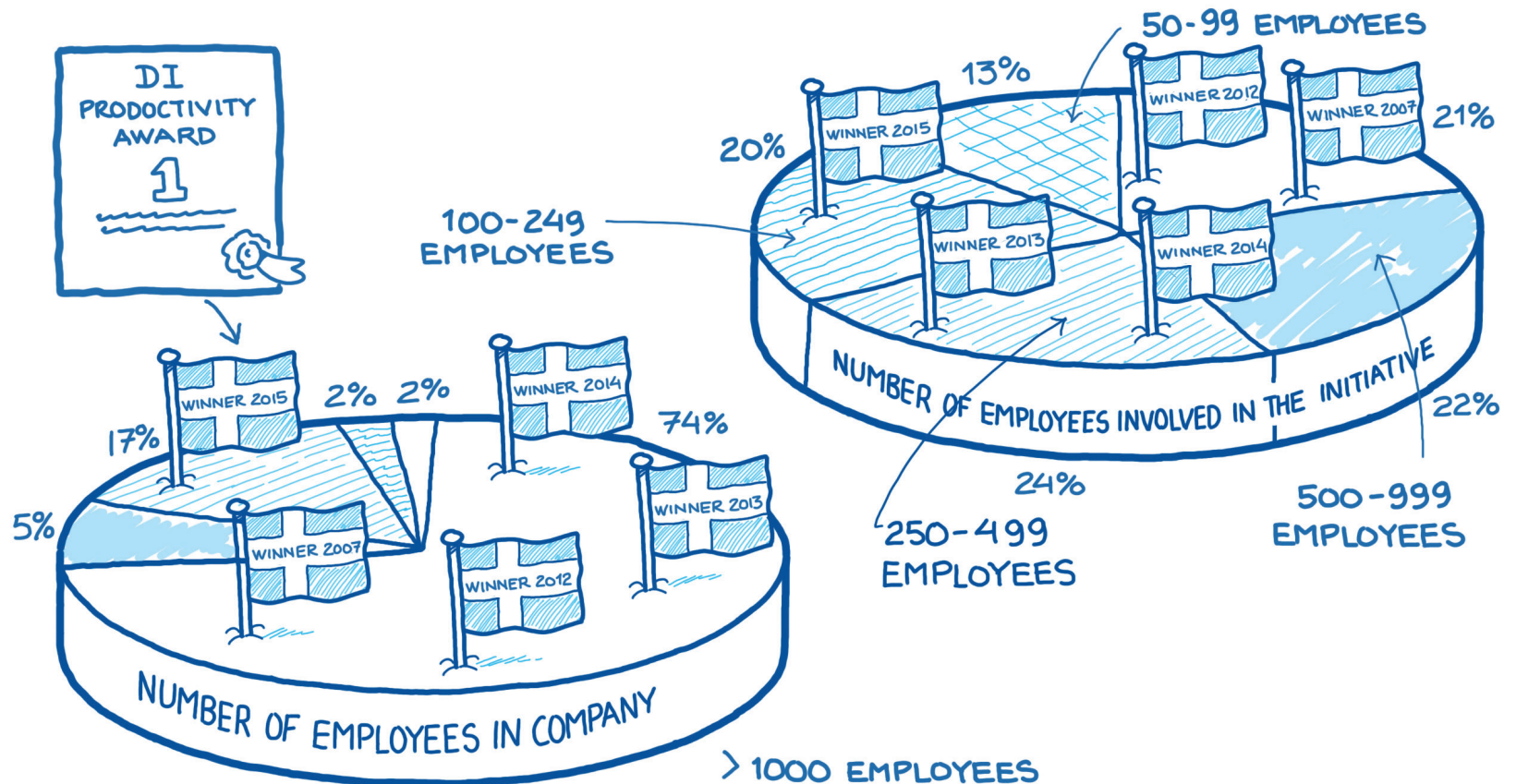


Applicants and initiatives – size and project scope

Figure 4 shows the applicant companies by size and number of employees participating in the described initiatives. It is probably not surprising that the data have an overrepresentation of large

companies – approx. 80% of applications originate from companies with ≥ 500 employees. Most of the winners can likewise be found in the $>1,000$ employees category.

FIGURE 4



DANISH PRACTICES FOR THE DEVELOPMENT OF PRODUCTIVITY

This section describes the companies' productivity initiatives. We describe the companies' 'productivity scope' and characterise the overall approaches taken in the initiatives.

From the application material, it quickly becomes clear that many companies have been inspired by lean. We have therefore endeavoured to discover the link between results achieved and the extent to which companies use lean. We have also analysed the companies' most frequently used 'lean concepts'.

The productivity scope of the companies

Figure 5 shows the companies' productivity scope in four categories:

- 1 Single improvement of one of the company's processes or systems, e.g. a cell or a production line
- 2 Improvement focused on an interconnected area in the company's system of operation, e.g. a product line across departments
- 3 Improvement of major areas in the organisation focusing both on the company's operations and support processes
- 4 Extensive improvement of the overall company system and integration with customers and suppliers

The majority of applications involve pilot projects and improvements focused on the company's internal system of operation – seemingly with the main emphasis on physical production processes (product flow). The bulk of the companies' initiatives can therefore be characterised as 'conventional', isolated productivity projects in which the main emphasis is on hourly productivity.

Only 8% of applicants seek improvements in close cooperation with other actors in the value chain which is surprising in the light of the relatively large amount of attention that has been given to supply chain management over the past ten years or more. This may be even more surprising when the massive fragmentation of production processes and externalisation of production activities (outsourcing and off-shoring) that has taken place over the past 10-15 years is taken into account.

FIGURE 5

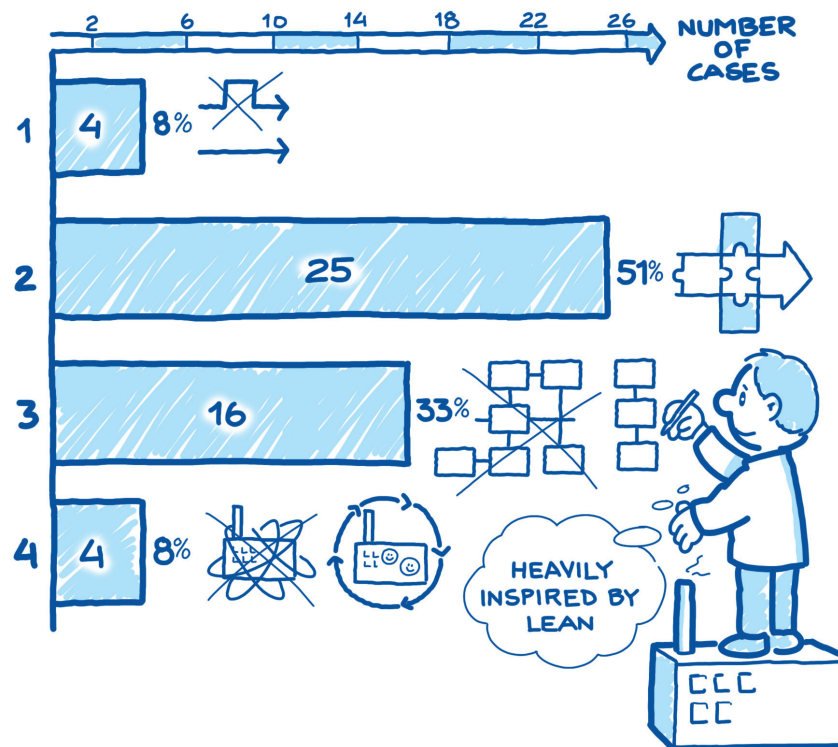
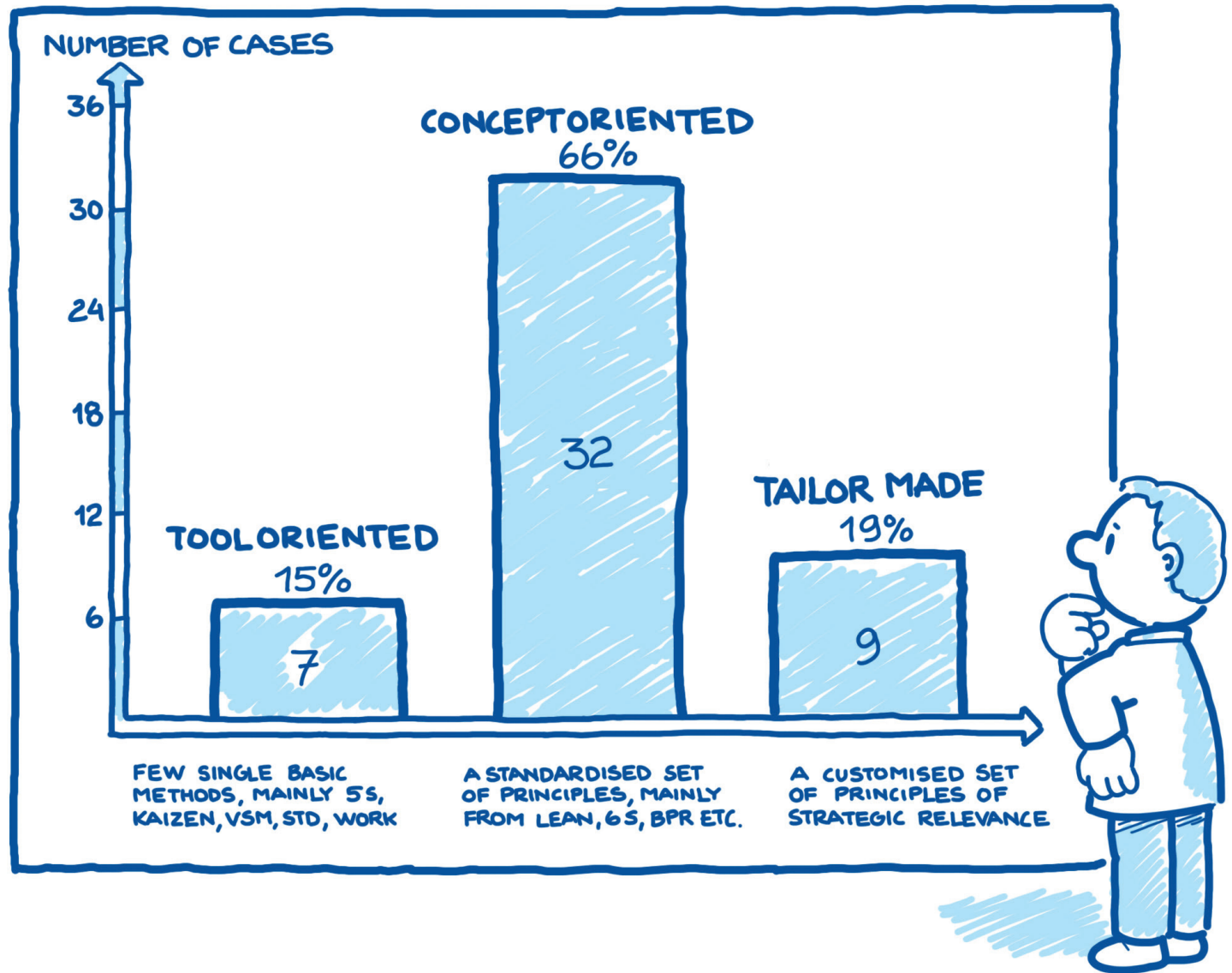


FIGURE 6



It is our impression, gained in other research, that very great potential for increased productivity is to be found in the company supply chains. But it is also our impression that these gains are often seen as difficult to 'harvest'. This is because external actors are frequently involved, which complicates the process, and because the SCM function compared to many other functions in the company is not as well developed or well established. This may be the reason why companies are more hesitant about launching productivity initiatives across the company supply chain. Another explanation for the lack of focus on the supply chain – overall – may be the signal that the Danish Productivity Award sends out and thereby the type of projects that the award attracts.

Design approaches

Figure 6 illustrates the approaches taken to select and design the content of initiatives. These have been divided into three categories:

- 1 TOOL-ORIENTATED – few isolated basic tools, mainly 5S, Kaizen, VSM and Std. Work
- 2 CONCEPT-ORIENTATED – a standardised set of principles, taken mainly from lean, 6Sigma and BPR
- 3 TAILOR-MADE – a customised set of principles of selective strategic relevance

15% of the initiatives work with isolated standard tools within specific areas. Approx. 65% of the companies 'boost' the level and work with 'standardised' concepts – and our impression is that these are mainly inspired by consultants. It can perhaps also be said that the starting point is tried and tested methods.

Only approx. 20% of companies 'design' their own concept of selective strategic relevance and 'adapt' it to their requirements and conditions. It is, however, our impression that the concepts are solely based on a selection of 'standard principles'. We have therefore found no surprising or new routes to improvement of productivity in this category either.

The lean angle

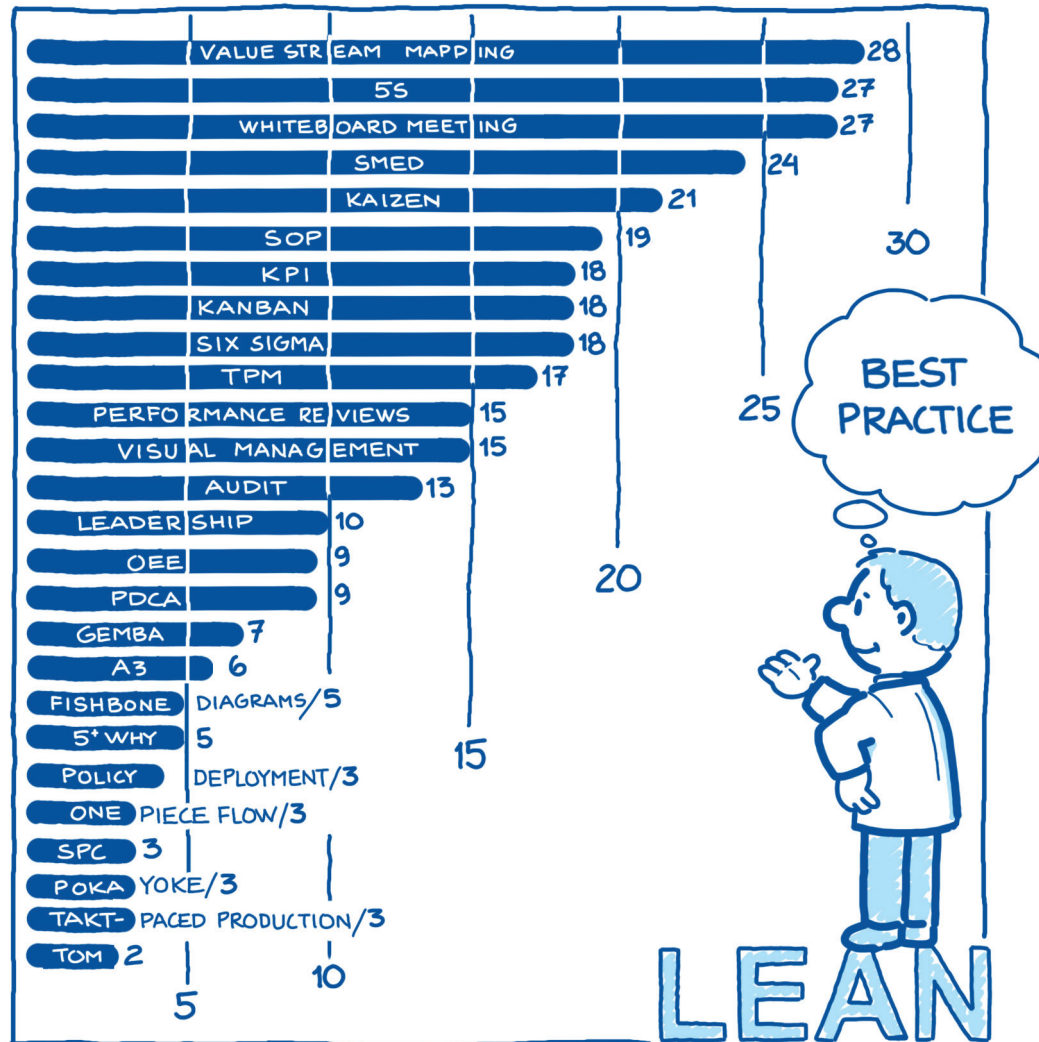
As previously indicated, lean-inspired concepts play a large role in the data. By far the majority of applications are in one way or another inspired by (partial) concepts related to the philosophy of lean.

Figure 7 shows a 'word count' of the most frequently occurring lean-related concepts. The figure has been produced by counting the applications in which the selected concepts occur. The concept of lean is mentioned in 42 of a total of 49 initiatives.

It is probably not surprising that an overrepresentation of the most basic lean methods – VSM, 5S, whiteboard meetings etc. – are found in the applications. But as lean has been known (and employed) in Danish industry since the beginning of the 1990s, it could perhaps have been anticipated that Danish industry had reached a higher level of maturity in its general application of lean concepts.

It is therefore more surprising to note how few times more advanced methods have been used – SPC, takt-pacing, one piece flow etc.

FIGURE 7



Lean and performance

The more lean tools, the better the performance outcomes? Does an optimum combination of lean components and partial elements exist? Unfortunately, we are unable – based on these data – to answer these questions comprehensively and unequivocally.

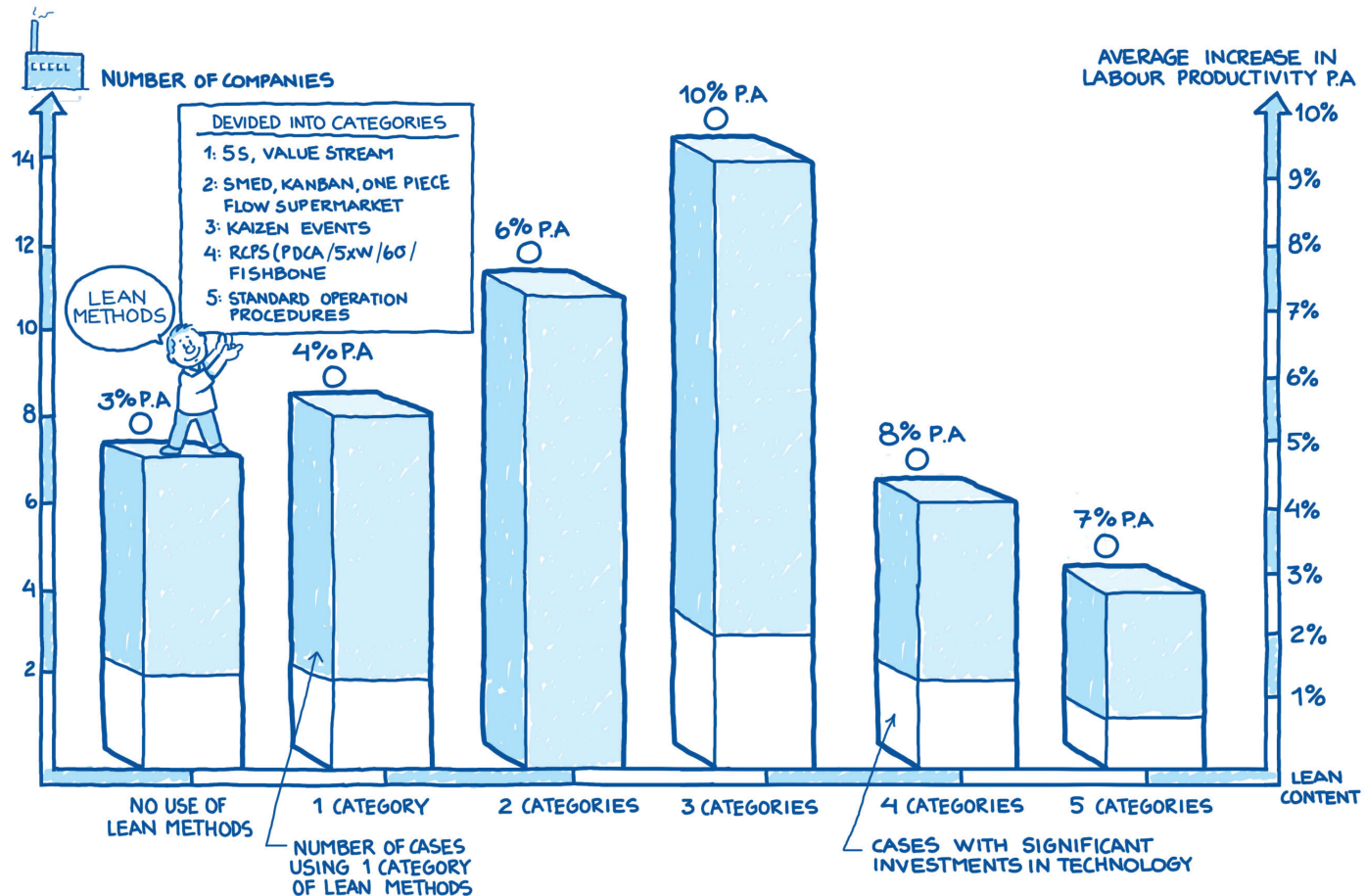
In Figure 8, we have described the companies' 'breadth of application' of lean. The starting point is a classification of lean tools into five categories:

- 1 5S, Value Stream Mapping
- 2 SMED, Kanban, one piece flow, supermarket
- 3 Kaizen events
- 4 RCPS (PDCA/5xW/6σ/Fishbone)
- 5 Standard Operating Procedures

Figure 8 shows how many companies have used 1) No lean, 2) One category, 3) Two categories, 4) Three categories, 5) Four categories, 6) Five categories of lean. The figure further shows the average productivity improvements achieved (small circle above each column) by the companies in each group.

The figure shows – based on these data – that all groups using some combination of ‘lean categories’ do better than the ‘no lean methods’ group. The figure also shows that the ‘three categories of lean methods’ group is the group that performs best by far. Cf. the figure of ‘three lean categories’ is the optimum lean range.

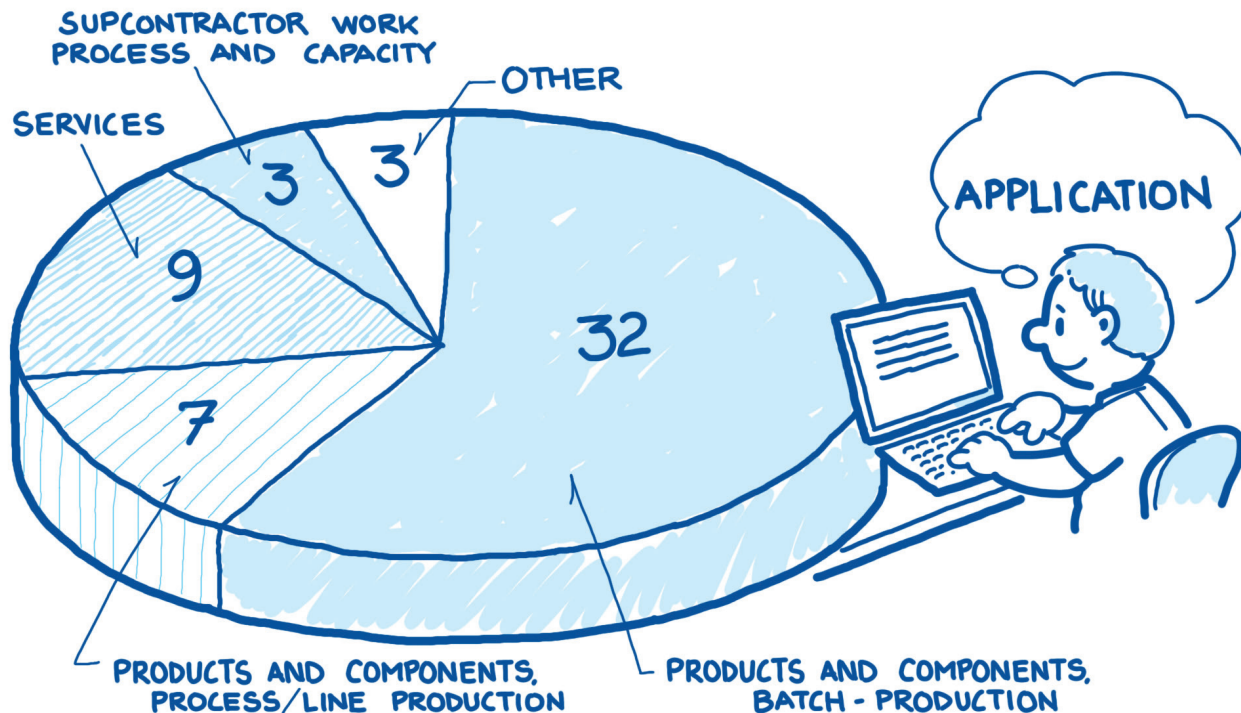
FIGURE 8



This conclusion should not be taken without reservation since performance outcomes for each group are based on the average of reported results while the data represent productivity initiatives of very differing kinds and scopes. The data also represent a mix of different industries, company sizes etc.

Between 25% and 30% of the applications introduce significant 'technology solutions' in the form of investment in automation, system upgrades etc. The data indicate that companies that also invest in 'technology solutions' achieve a higher increase in productivity than companies that do not include investments in 'technology solutions' in their initiatives. The data do not allow a more in-depth analysis of this observation.

FIGURE 9



RESULTS ACHIEVED – DATA USED

The data comprise a total of 54 applications which include five companies that have applied for the award two years in a row based on the further development of the same scenario. Below, these applications have been consolidated in the most recent application.

Of the remaining 49 applications, 11 applications do not report quantitative productivity outcomes. This means that 38 applications form the basis for an analysis of the results achieved.

Figure 9 shows the distribution of the 54 applications by type of industry.

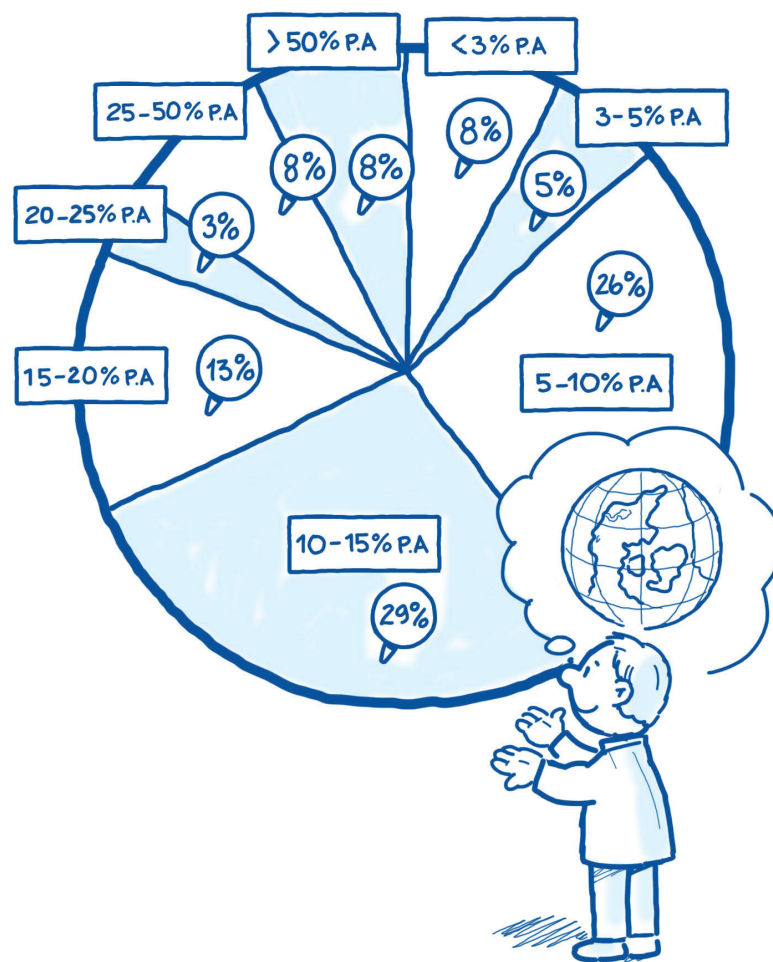
Results achieved

Figure 10 shows a scoring of the companies' achieved results based on the average productivity improvements achieved (per annum) over the period of the initiative. The scores cover intervals as there is some uncertainty associated with the available data. The data have also been consolidated across productivity categories.

As can be seen in Figure 10, the companies have achieved remarkable productivity increases. Eight percent (8%) have achieved an annual increase in productivity of more than 50%. Almost 20% (accumulated) of the companies have achieved an increase in productivity of more than 20% per annum.

On average, the entire sample has achieved an increase in productivity of approx. 12.5% per annum which, in comparison with the total annual increase in productivity across Danish industry, is impressive.

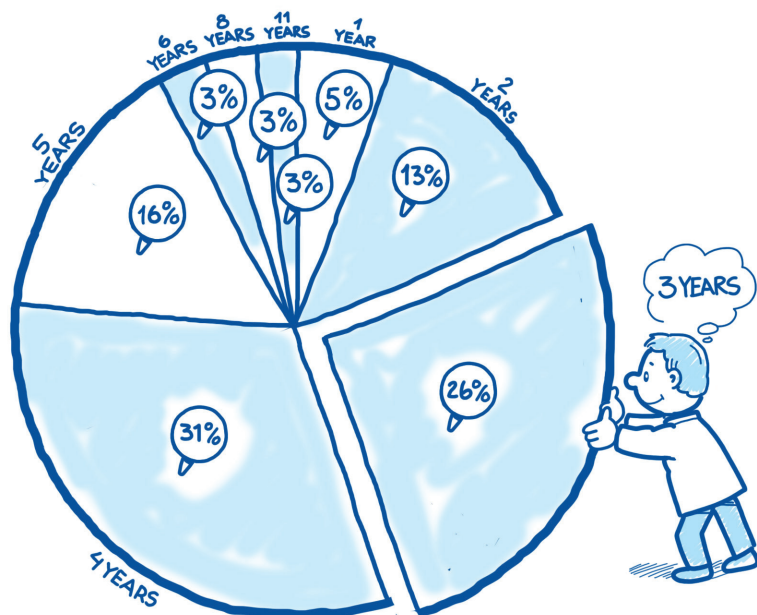
FIGURE 10



It is overwhelmingly the largest companies with more than 1,000 employees that post the best results. It is also usually major companies that win the Confederation of Danish Industry's Productivity Award. In 2015, one company with fewer than 500 employees, however, managed to win the award. The SME category with fewer than 250 employees is not even represented in this analysis due to insufficient information within these applications.

If this is an expression of the potential that exists in industry, Denmark has an enormous potential for improving its competitiveness and supporting growth. The big question is how to release this potential? Our feeling is that challenges are perhaps greatest among small and medium-sized enterprises.

FIGURE 11



The duration of the initiatives

Figure 11 shows the duration of the initiatives described in the applications. It is evident that the majority of initiatives have had a duration of between three and four years – approx. 57% of the total population. The longest-running initiatives have a duration of eight to eleven years.

Figure 12 groups initiatives of similar duration and shows the achieved productivity increases per annum and the scope of the initiative measured as the number of employees involved in the initiative. Initiatives with a duration of more than five years have been omitted.

The prevailing approach involves projects in isolated areas in preparation for roll-out across the group at a later stage. Only a few companies implement sweeping initiatives in large units such as a whole factory or a whole division.

Figure 12 indicates that the outcome – in terms of average annual rise in productivity – falls as the duration of the initiative increases. In all probability, this indicates that initiatives with a duration of one to two years mainly focus on 'low-hanging fruit' – and not on establishing a lasting productivity-promoting system with the same impact as the early initiative.

Long-term initiatives

The number of companies that have completed high-performing productivity projects that have run for four and five years or more is impressive.

FIGURE 12

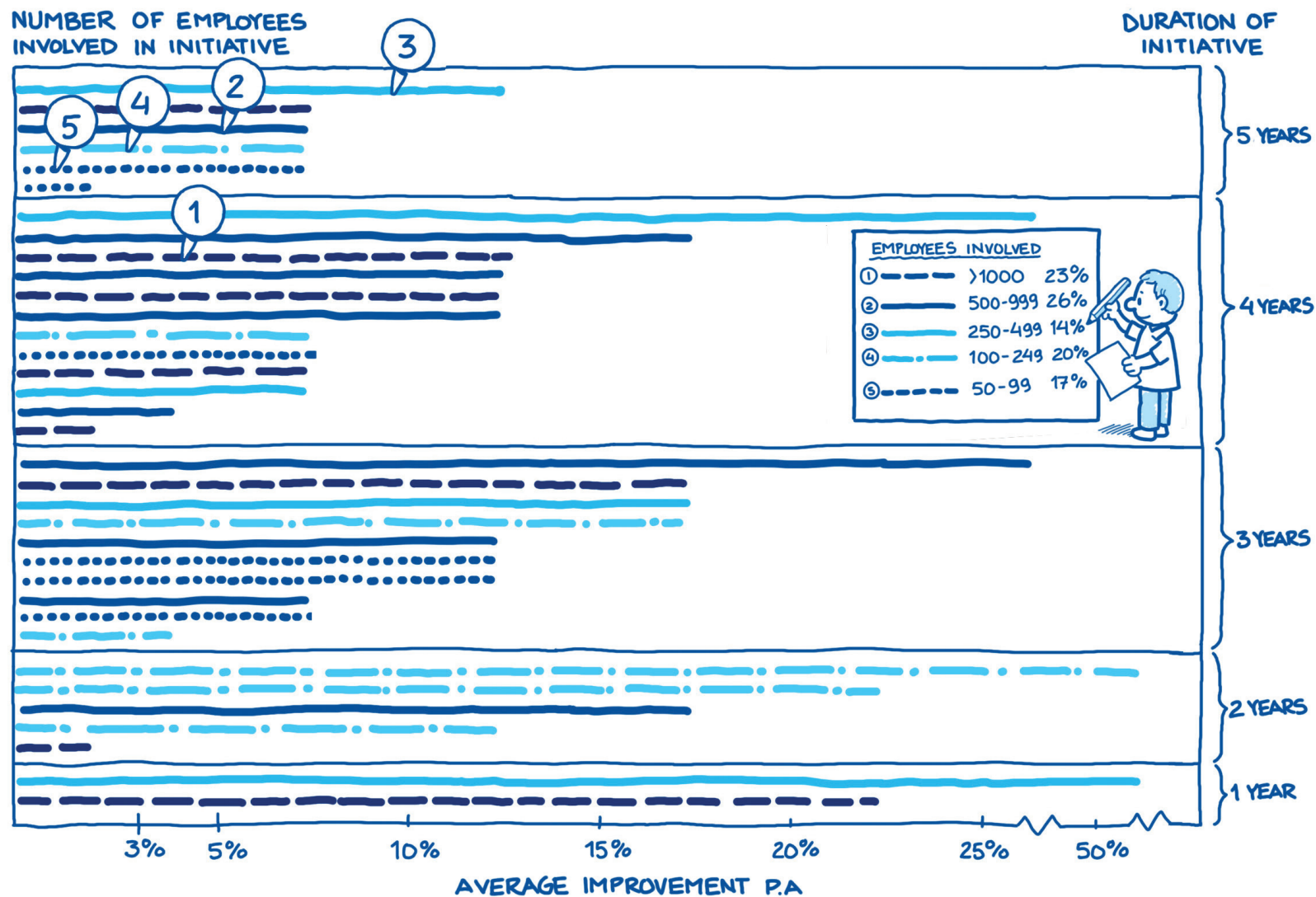


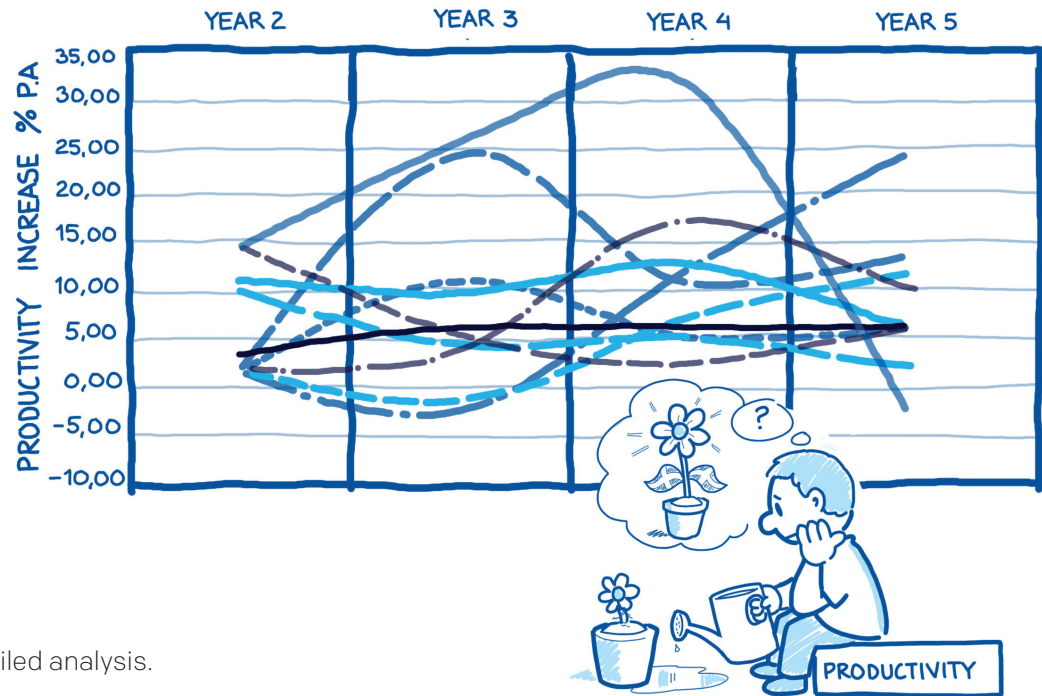
FIGURE 13

Figure 13 shows initiatives with a duration of four and five years. Initiatives completed in four years are shown with a start date in Year 2. The figure shows the achieved increases in productivity reported for each year of the life of the initiative.

Most of the initiatives run an expected course where it may be possible to apply a project perspective:

- 1 Setting-up, 'harvesting low-hanging fruit', establishing project organisation and project formulation
- 2 'Project foundation', training, organisation, detailed analysis. Initiating results
- 3 'Project execution', monitoring, project operation, project management. Consolidating results
- 4 'Project phase out', dismantling project organisation, focus on daily operations of new systems. Sustaining results

The data seem to indicate that only very few of the companies are able to sustain a consistently high level of productivity development, but fall back to a 'normal' level. Much also indicates that the initiatives are designed and planned as projects that have an introductory and a



concluding phase and not as projects that result in a continued 'productivity system' that generates high levels of growth in productivity for a longer period.

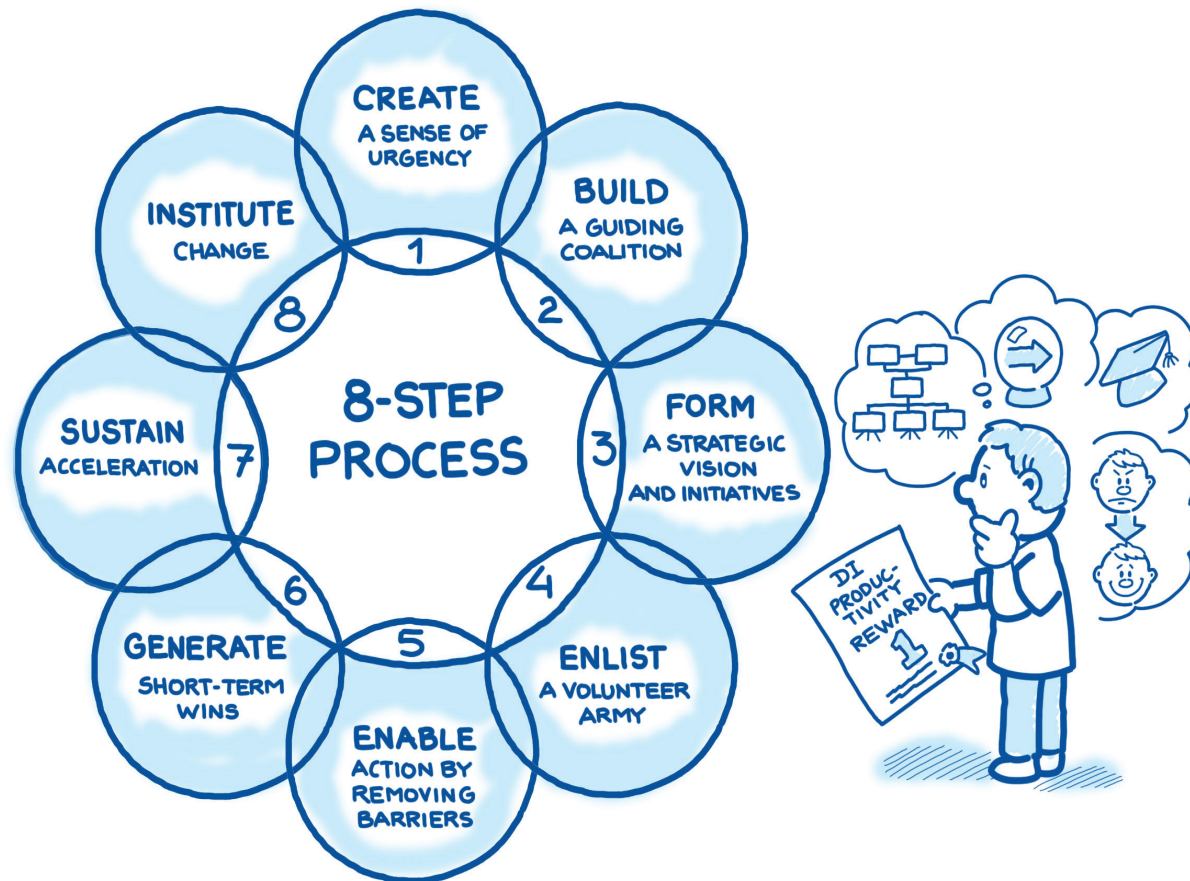
It may therefore also be said that there is a long way to go before 'The Toyota Production System' is achieved. This is despite the fact that TPS has been a source of inspiration for more than 30 years – or do we really want high-performance systems of this kind in which everything runs like 'clockwork'? Is the closest we get to TPS the Danish abattoirs?

CHANGE LEADERSHIP IN PRODUCTIVITY INITIATIVES

The change leadership efforts described in the applications for the Confederation of Danish Industry's Productivity Award have been assessed based on Kotter's recognised eight-step model for successful change. As the majority of applications only cover

the preliminary phase of extensive change processes, the analysis only addresses the first five elements of Kotter's model which focuses on building up a robust foundation for long-term change as can be seen in Figure 14.

FIGURE 14



The elements involve:

- 1 Basis for action – adapt organisational structure, prioritise skills development, update staff systems, align employee incentives, show consistency if opposed
- 2 Communication of vision – simplify the message, communicate in many fora, use the power of the example, mobilise many interfaces, request high levels of reporting
- 3 Strategic vision – make it conceivable and possible, be focused but flexible, must be doable, articulate simply and logically, owned by the guiding coalition
- 4 Guiding coalition – involve candidates with distinct leadership, ensure access to expertise, select managers with good track records, include positions of influence, more team-building activities
- 5 Perception of necessity – point out weaknesses, set aggressive improvement targets, launch turnaround initiatives, generate contact with dissatisfied customers, expose obvious opportunities

All applications have been analysed and assessed – on the basis of a five-point scale – in relation to each Kotter element. Based on these scores, a 'Kotter index' is formed that describes the implementation and organisational efforts contained in the initiatives.

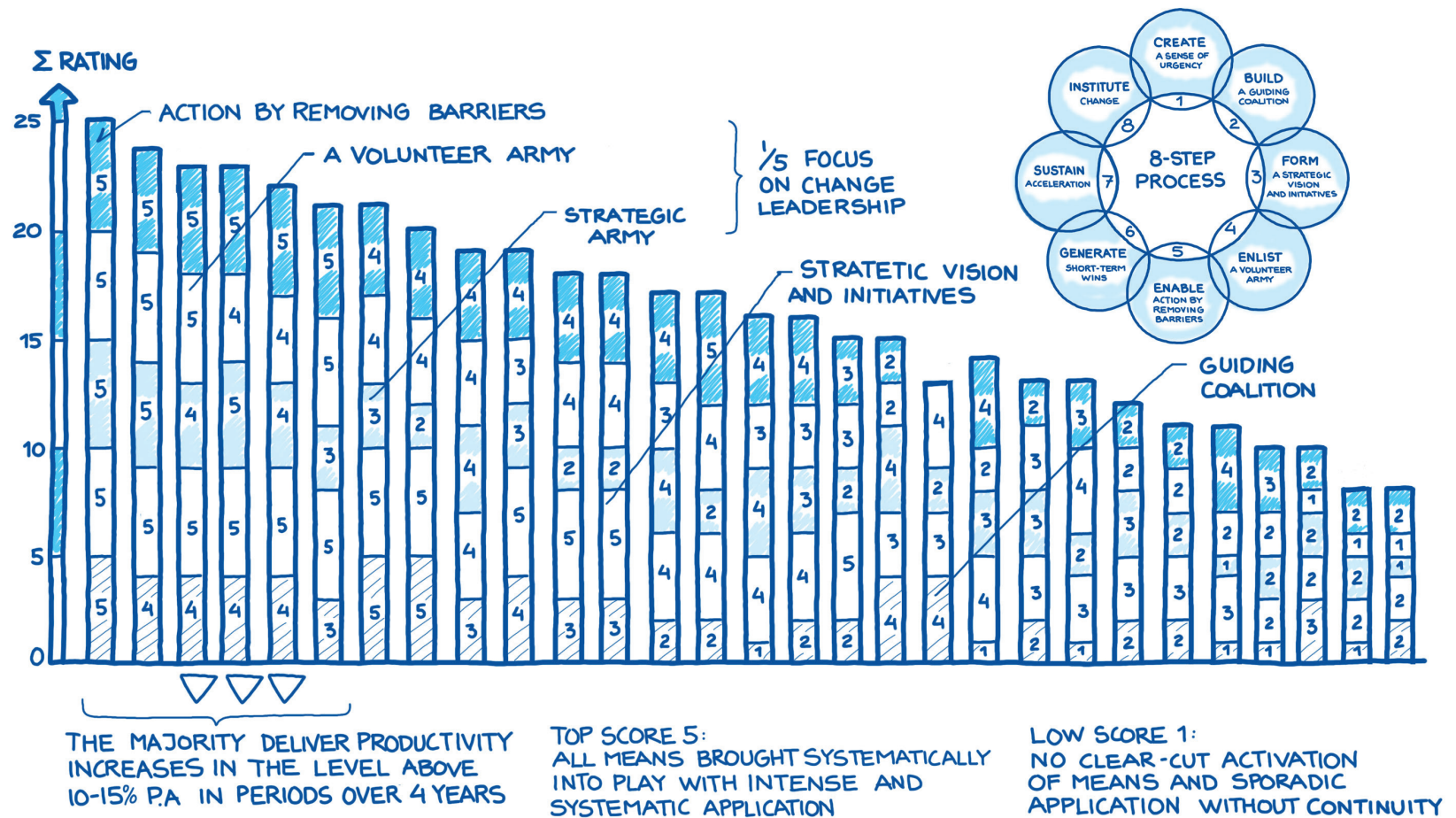
The result of the analysis can be seen in Figure 15 in which the applications have been arranged in descending order based on their 'Kotter index score'. All the Confederation of Danish Industry winners are found in the Top 10.

Evaluation of change leadership in initiatives

Applications that score high on the proposed 'Kotter index' mainly express more 'stamina' and are usually also able to demonstrate consistent increases in productivity at a high level for at least four years. It is overwhelmingly – and not surprisingly – the larger corporations that score highly on the 'Kotter index', especially when the initiatives involve a significant number of employees.

The communication of strategic vision is prioritised highly in companies with long-standing programmes and many stakeholders – simple messages are communicated in many fora, the power of the example is applied actively, many interfaces are mobilised to make the whole coalition participate empathetically in communication, great demands are made of reporting.

FIGURE 15

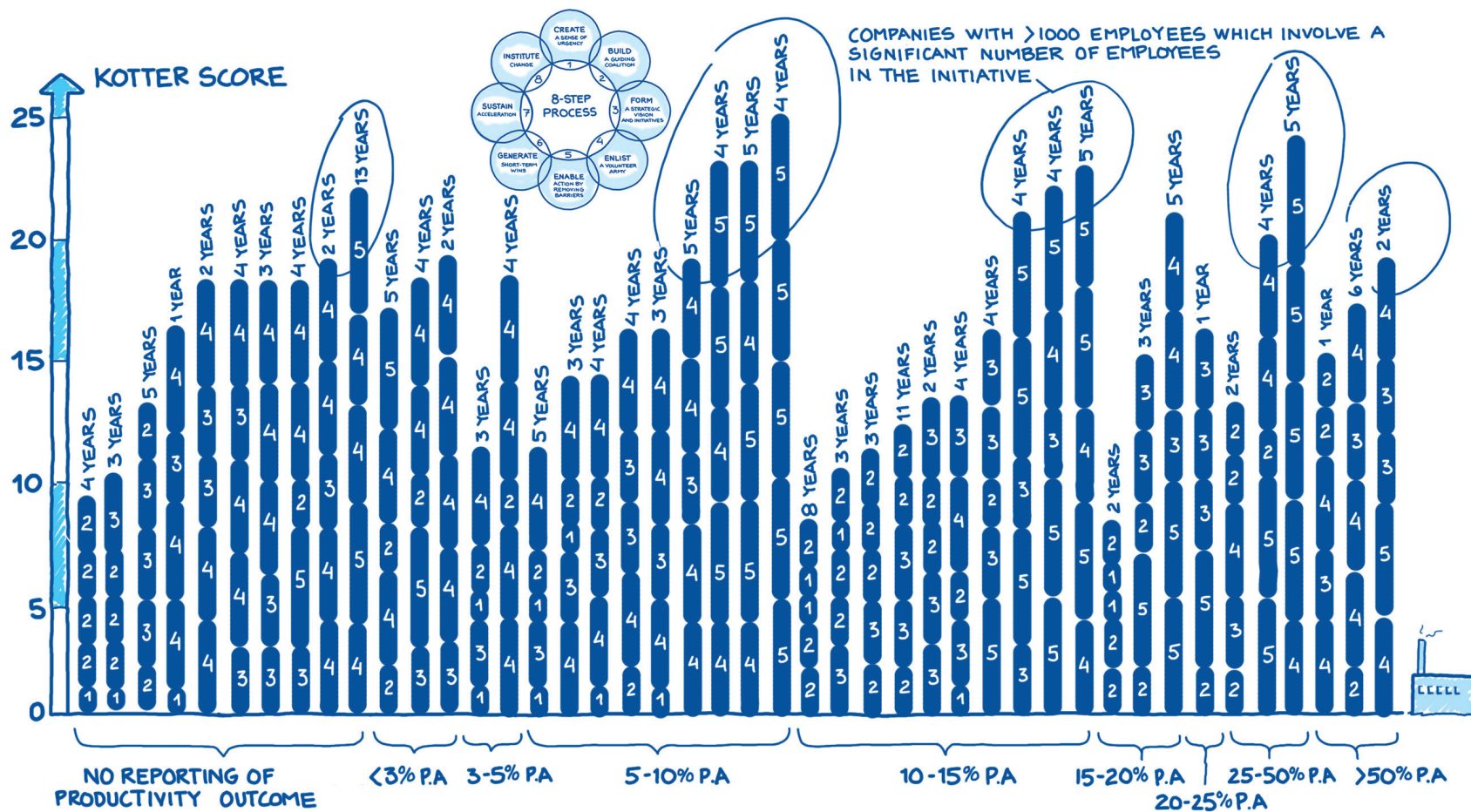


Kotter score and results achieved

The correlation between the 'Kotter score' and productivity results achieved across individual applications can be seen in Figure 16. As can be seen in this figure, no obvious correlation exists between the 'Kotter index' and results achieved. Many companies even achieve significant results at the lower end of the 'Kotter index'.

This is a surprising result – and yet? A high 'Kotter score' does not preclude strong results, but neither is it a prerequisite. We are of the opinion that companies are able to achieve strong results if there is the will to make them happen. This 'will to manage' is to some degree independent of the activities that have been highlighted in the applications and thus form the basis of the 'Kotter score'. In reality, 'will' is perhaps more important than 'knowing the right ingredients'?

FIGURE 16



Individual Kotter elements and results achieved

Figures 17, 18, 19, 20 and 21 show the link between each 'Kotter element' and results achieved. The elements are:

- 1 Perception of necessity
- 2 Guiding coalition
- 3 Strategic vision
- 4 Communication of vision
- 5 Foundation for action

As can be seen from the figures, no simple correlation exists between any 'Kotter element' and results achieved.

We could be tempted to ask: What determines the results achieved in the analysed cases if it is not unequivocally the methods used and it is not the implementation and organisation of the projects (Kotter index)? We do not have a clear-cut answer to this, but some of our reflections can be found below. Ideally, we would like to complete a more comprehensive and structured study of the productivity work that is currently carried out in Danish industry. Only time will tell whether a project documenting clear relationships will be viable.

FIGURE 17

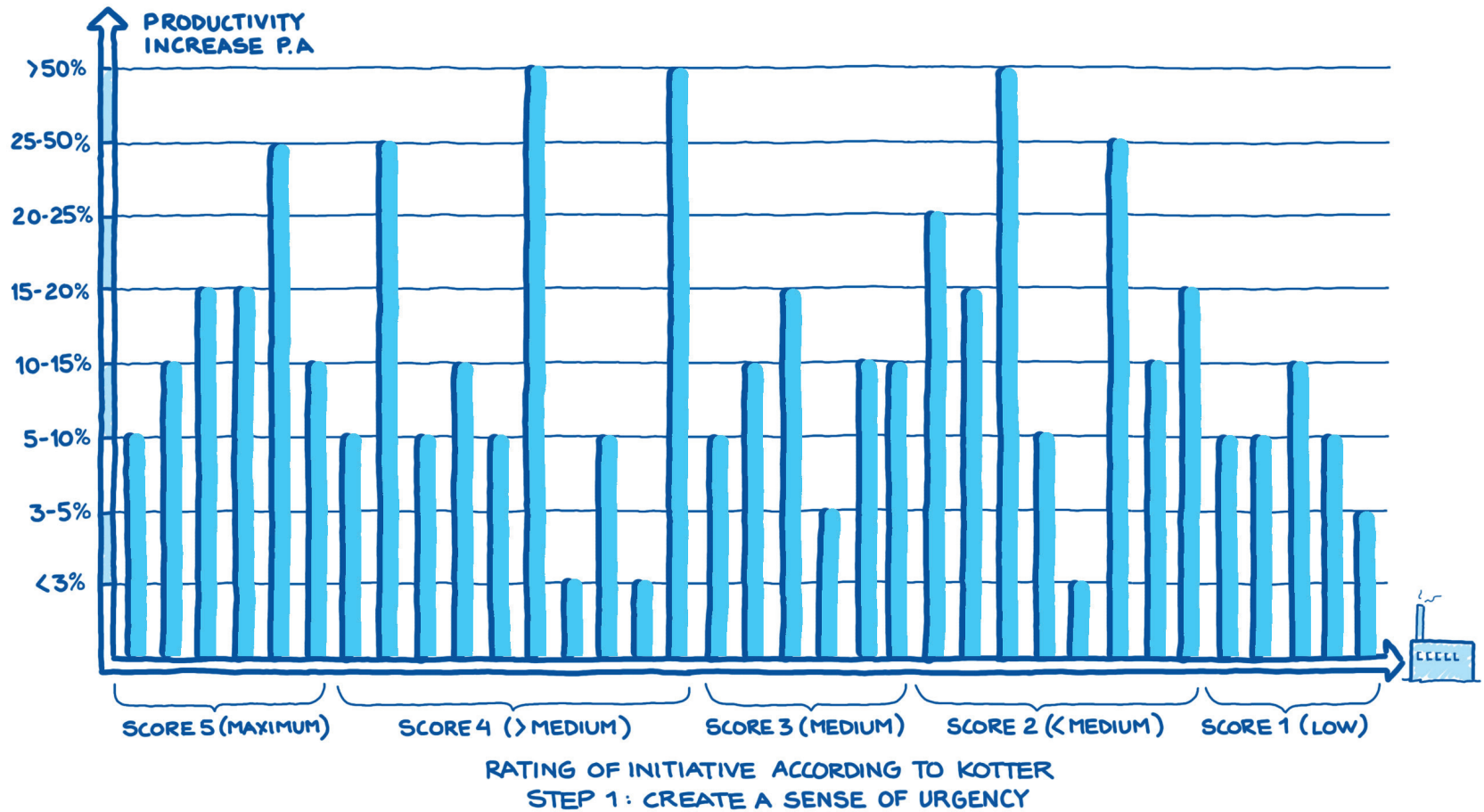


FIGURE 18

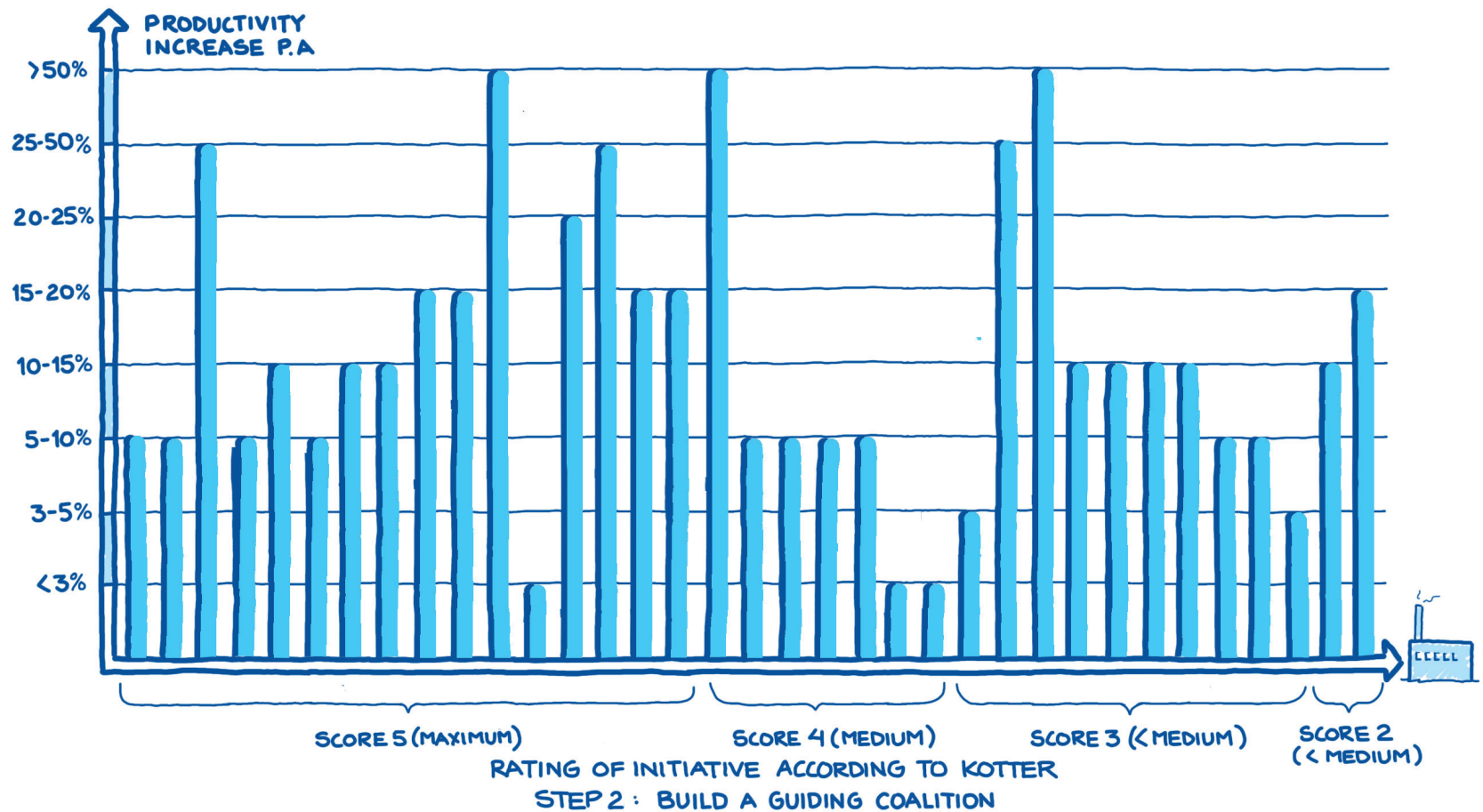


FIGURE 19

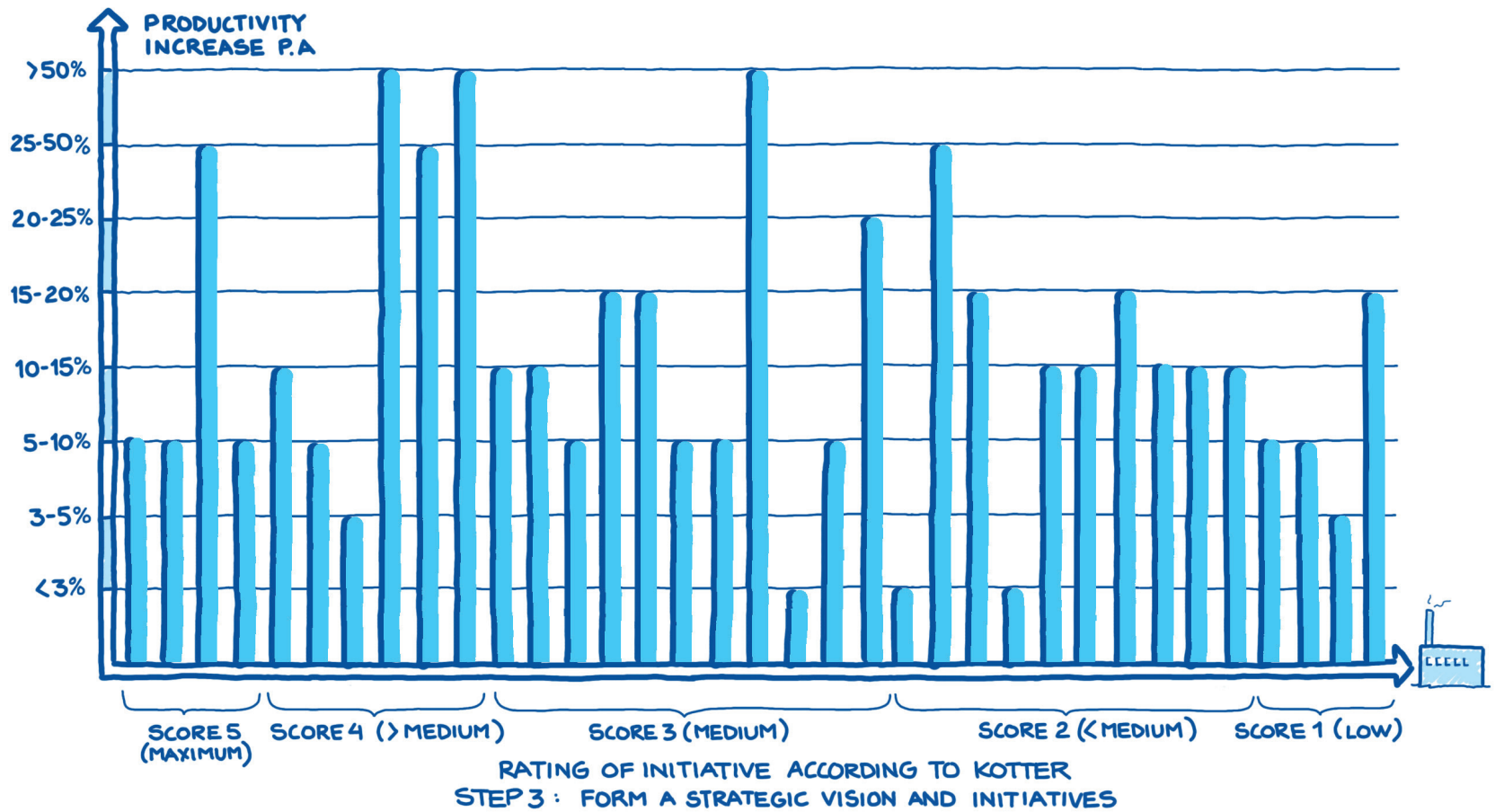


FIGURE 20

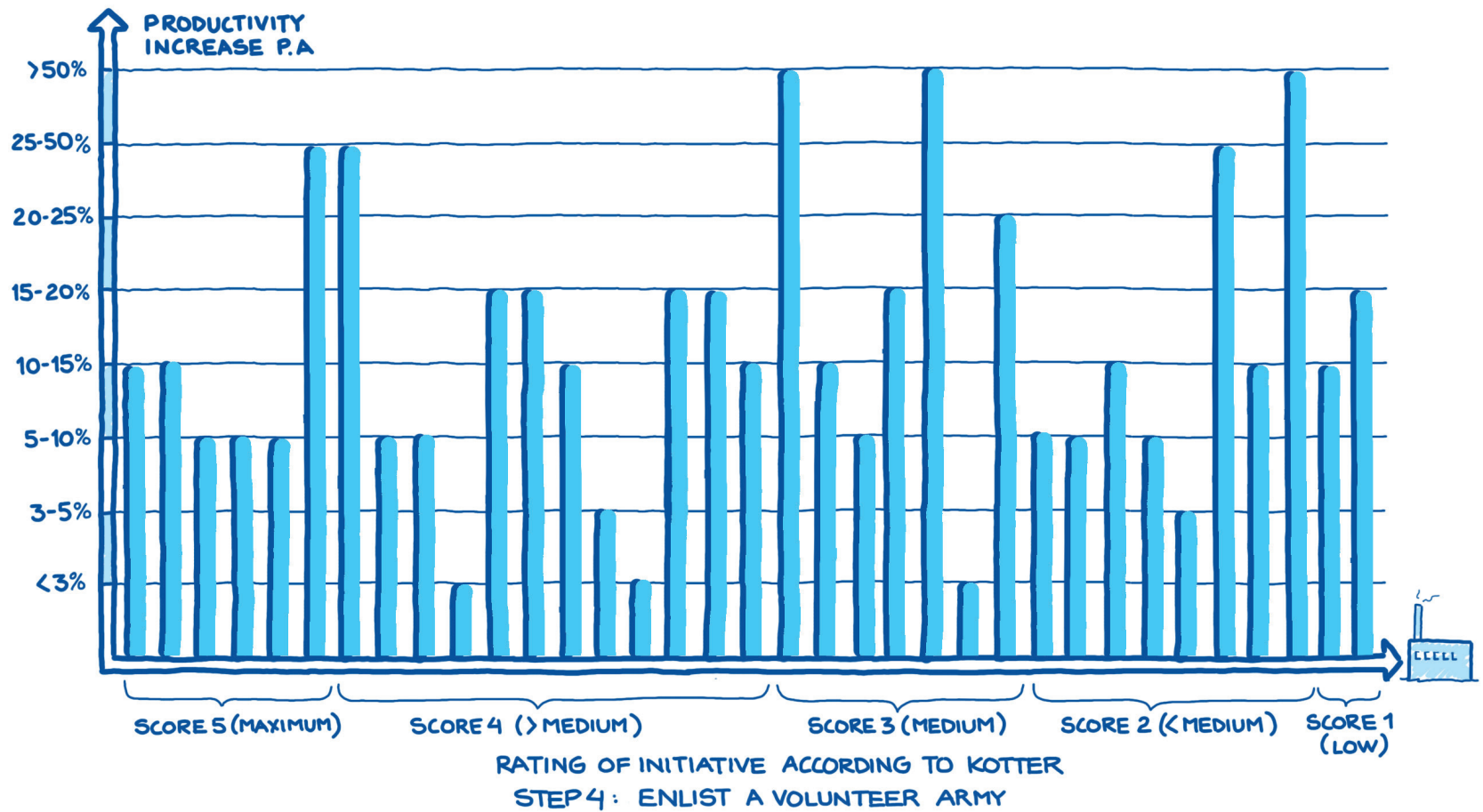
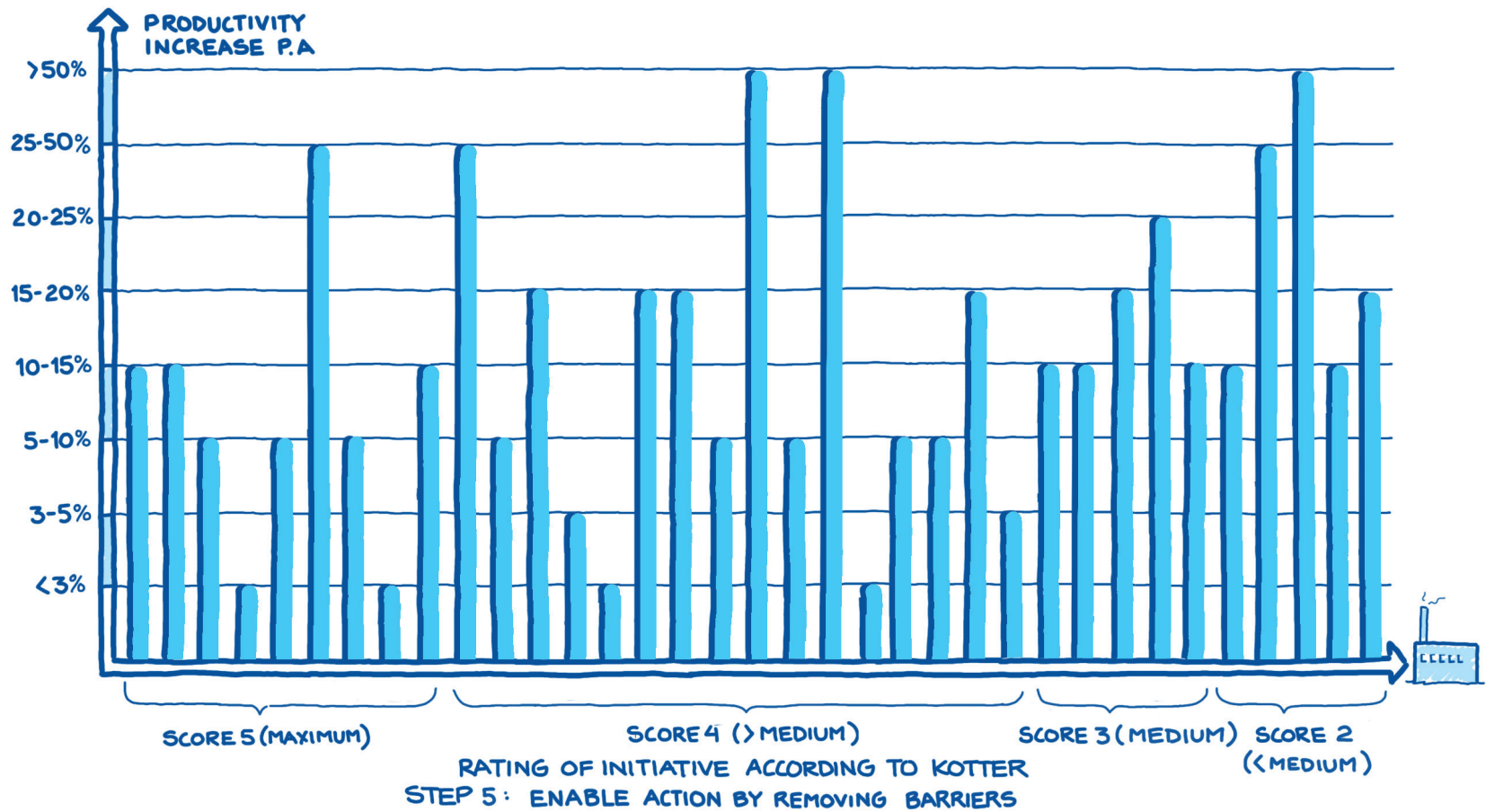


FIGURE 21



OBSERVATIONS AND REFLECTIONS

Great potential

The presented data show that many companies have achieved remarkable results. Even in the long-term initiatives – over four to five years – we observe substantial results. In the presented data, an average productivity increase of >12% per annum is achieved.

If this result could be transferred to industry across the board, enormous potential just waiting to be realised is to be found in the Danish manufacturing sector. Thereby the competitive challenges facing Denmark could be seen in a completely different light.

No easy shortcuts

Unfortunately, no sure-fire, quick-fix solutions that ensure high growth in productivity exist. It is very clear that lean works as an important focal point for by and large all the companies in this study.

Lean, again...

The correlation between lean methods applied and results achieved is far from clear cut. Something seems to indicate that the more lean is used, the higher the growth in productivity. Something else seems to indicate than an 'optimum' level of lean exists which means that an increase in productivity grows to a certain point after which it falls away again when this 'optimum' level of lean is exceeded.

We cannot find an explanation for this phenomenon in the data used. It might be conceivable that a deep understanding and acceptance of the methods applied is more important than the

number or breadth of methods used which leads to an 'optimum point' – also seen in the light of the maturity we have seen in the case material.

Maturity

As mentioned above, lean is very central to these data. But it seems odd that since John Krafcik launched the term and the concept in 1988, we still overwhelmingly only apply basic tools such as 5S, whiteboard meetings, Kaizen, VSM etc.

If lean has been accepted as the basic productivity method in Danish industry, we believe that lean still offers great unexploited potential. There is still a long way to go to the TPS/TPM ideal – if this is indeed the ideal.

Implementation

We have used elements from Kotter's model of change leadership to assess the implementation and organisational efforts in each case. It could be assumed that a correlation exists between the 'Kotter score' and the achievement of productivity – the higher the 'Kotter score', the higher the project gains. But this is seemingly not the case. It is remarkable, though, that more or less all the winners are to be found at the upper end of the 'Kotter index'.

We cannot identify a correlation between any of the individual Kotter elements and the achieved productivity gains either. But we recognise the efforts that the 'Kotter index' represents. We are of the belief that the 'Kotter index' is particularly important to the largest productivity initiatives and a prerequisite for the imple-

mentation of these projects. The 'Kotter index' is perhaps rather a hygiene factor than a winning factor?

Pattern breakers

In these data, we see very few 'pattern breakers' – if any at all. We mainly see the use of standardised 'SOFT TECHNOLOGIES' – such as lean – which require relatively 'modest' investment and follow tried and tested practices. These 'SOFT TECHNOLOGIES' are perhaps also practised conservatively and mainly defined from an internal company perspective. Only 8% of the companies surveyed address integration with customers and suppliers as a vital method. Supply chain management has been a prominent buzz-phrase since the end of the 1990s and the potential of SCM has been emphasised countless times. But this perspective is rolled out only very modestly in the cases represented here.

Technology

We see a tendency for companies using technology as leverage for increased competitiveness to achieve significant results. For example, automation, digitisation, advanced monitoring, communication.

Nonetheless, only a few companies use the boost of technology as their main driver in efforts to increase productivity. We wonder about the scope – or rather lack of scope – of technology projects and investment in technology-driven productivity. Also seen in the light of the heated debate of which technology has been the subject in the past four to five years.

What now?

We have observed fantastic results in our case material. Despite the many common characteristics, we have also identified many differences. We have not been able to infer an unequivocal set of 'best practices' – apart perhaps from the fact that the majority of companies like to use tried and tested lean practices.

On the other hand, we have also observed cases in which companies achieve good results without being completely faithful to these 'best practices' or in which companies position themselves at the 'light' end of 'best practice'. We note, in particular, that we cannot identify a correlation between the way in which initiatives are organised and implemented – measured as a 'Kotter index' – and the stated results achieved. What now?

The impression could be that the most important determinant for successful initiatives to increase productivity is not the method used or approach taken, but the 'will' which perhaps in the final instance depends on the company's dedication to leadership? So maybe – 'IT IS STILL ALL A LEADERSHIP ISSUE'?

SOURCES

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